Aviano Hospital is First International Facility to Earn the ENERGY STAR

Aviano Hospital, which supports the U.S. Air Force 31st Fighter Wing at Aviano Air Base, Italy, has become the first U.S.-operated facility outside the country to earn the ENERGY STAR® for superior energy performance from the EPA. The 21-bed acute care hospital uses 21% less energy than its peers on average, putting it in the top 24% of U.S. hospitals in terms of energy performance.

The 3-story, 129,819-square-foot hospital provides inpatient and outpatient care, internal medicine, behavioral medicine, developmental intervention, and general, orthopedic, and ob/gyn services to the 9,200 Active Duty personnel and their families on base.

In a local news story, Lt. Col. John Savage, 31st Medical Support Squadron commander said, "The 31st [Medical Group] has dramatically cut its energy use, saving hundreds of thousands of taxpayer dollars and making the hospital the 'greenest' in the Air Force. When the new hospital first opened in July 2006, we had very high energy bills. Group leadership directed our facility management to conduct a study of possible energy saving initiatives. The study became our roadmap to energy saving success."

Aviano Hospital, Aviano Air Force Base, Italy. *Source: Aviano Hospital*

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Energy Action Plan

Manuela Solda,
Facility Manager,
Aviano Hospital

Source: The Official Website of Aviano Air Force Base

The hospital teamed up with its maintenance contractor Johnson Controls Inc., Italy, to produce the study. The facility manager of Aviano Hospital, Manuela Solda, a native Italian who has worked at the American air base for the past ten years, transformed the study into a detailed action plan with performance goals, timelines, and dedicated resources. "We began with a simple strategy: To build momentum, we wanted to achieve quick, low-cost wins at first", she says. "Then we sold the success to our leadership to build broad support for larger projects that had even better returns".

Instituting operational best practices for quick low-cost savings began with analyzing light requirements during off-duty hours and weekends. Solda says her department found immediate savings by automatically switching off two-thirds of the lights in common areas and hallways while keeping enough light on for security and maintenance requirements. She also controlled lighting in unoccupied areas of the hospital by automatically switching them off. *Annual savings: $19,000*

Next, their focus turned to increasing the operating efficiency of the hospital's central chiller system through a practice known as chilled water reset. "We found that we could raise the chilled water set point to better align our chiller output with actual load requirements, based on outdoor conditions," explains Solda. "Raising the chiller coefficient of performance with this practice produces modest energy savings, but we also expect it to increase the life expectancy of the equipment and reduce our maintenance costs." *Annual (energy) savings: $3,200*

Facilities management engineers began improving the operations of existing equipment in other areas of the hospital. Air handling units in administrative areas were programmed to be turned off on weekends and during off-duty hours. This created a bit of a stir among those affected at first, Solda says, but it had a side benefit of increasing work efficiency during normal business hours since optimal comfort levels weren't guaranteed around the clock. Some exceptions are made; for example, the default schedule can be overridden in times to support military readiness exercises or weekend patients. *Annual savings: $28,000*

To improve HVAC efficiency, engineers modified the system logic in the digital controls to link the supply-air temperature (SAT) with outside air temperatures. Now, during periods of milder weather, the SAT is reset upward to reduce wasteful reheating of already cooled air. Aviano hospital uses the most common reset strategy, explains Solda: "When the weather is cooler, our supply-air temperatures are reset according to a table we developed that lists outside air temperatures and the corresponding SAT. But to provide the best comfort levels, we've had to fine-tune the reset parameters based on actual performance." *Annual estimated savings: $25,000*

Perhaps the change that required the most readjustment for hospital personnel was a proposal to modify indoor air temperatures within administrative

areas. People like their comfort zones and resetting summertime temperatures from 73.4˚ F to 75˚ F and wintertime temperatures from 69˚ F to 68˚ F was considered excessive by some. However, when it was revealed that the cost savings (coupled with AHU schedule changes mentioned above) would be equivalent to hiring a new medical technician or purchasing needed orthopedic medical equipment, the proposal was accepted. "When somebody says 'I'm cold,' the easy way out is to throw dollars at it by increasing heat to an entire zone," Solda says. "We spend time trying to figure out why people are uncomfortable and end up with solutions that cost vastly less, whether it's moving a vent, adjusting a grill louver, or repositioning a desk away from a draft." *Annual savings: $22,000*

A year of low-cost operational improvements in 2008 gave Aviano Hospital an ENERGY STAR energy performance score of 65, which meant that it was performing better than 65% of its peers in the United States. Still unsatisfied, Solda's team wanted to achieve the top 25% performance level and earn the ENERGY STAR. That meant they needed to shave off another 10% of their energy consumption to attain the minimum score of 75 required to be eligible for the ENERGY STAR. With leadership now knowledgeable of the benefits an energy management program can offer, Solda began pitching projects requiring capital investment to close the 10-point gap.

Larger Projects

Soon afterwards, administrators at Aviano approved funds to install an air-side economizer to the hospital's chiller in 2009. When the outside temperature and humidity are mild, economizers save energy by cooling buildings with outside air rather than using refrigeration equipment to cool recirculated air. A properly operating economizer can cut energy costs by as much as 10 percent of a building's total energy consumption (up to 20 percent in mild, coastal climates), depending on local climate and internal cooling loads. Although the economizer was installed early in the year, the real savings won't occur until the autumn of 2009 when temperatures begin to fall. Solda is optimistic that savings will be significant. During a 15-day test run last spring, the hospital reduced natural gas consumption by two-thirds. Project cost: $176,000

Aviano hospital's largest efficiency investment was replacing its outdated HVAC system. During construction in 2006, the new hospital was integrated with an older clinic which had five air handling units. Replacing those with a new high efficiency unit reduced both energy consumption and maintenance, but it also allowed engineers to interconnect the new unit with the facility's energy management system for greater control of temperature and scheduling. Project cost: $458,000

Solda's last project helped put the hospital into ENERGY STAR territory. Certain spaces in the hospital like the labs, computer data center, and sterilization areas have greater cooling requirements than other places, explains Solda. Rather than lowering the temperature of these zones and over-cooling other areas, her team took a targeted approach and placed spot coolers in these spaces to accomplish the task without affecting the hospital's general HVAC plant. Project cost: $48,000

Mission Accomplished

Aviano Hospital has become a model of operational excellence. In less than two years, the facility has reduced its energy use by more than 10 percent at a cost savings of more than $140,000, and reduced greenhouse gas pollution associated with energy consumption. Their passion for continuous improvement reminds us of what it takes to get the mission done. And their strategy of starting out with low-cost operational improvements demonstrates best management of scarce resources. EPA congratulates Aviano Hospital for its success. They are lean and green in every sense of the word!

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